

### ABSTRACT OF THE DISCLOSURE

[29] A circuit for a nuclear magnetic resonance probe uses three resonators to create resonances intermediate to the resonator resonant frequencies. The circuit is particularly useful for creating magnetic fields for two closely spaced high frequencies, such as those used for the excitation of  $^1\text{H}$  and  $^{19}\text{F}$ . The resonators are arranged in a parallel combination, or the electrical equivalent thereof, with input ports connected to it for inputting the desired high frequency resonances. Admittance inverters may be used to provide isolation between the input ports. Some of the resonators and the admittance inverters may be transmission lines. The transmission lines may have additional ports for additional input signals of lower frequencies located at null points for the frequencies of the signals coupled to the primary input ports. Adjustable dielectric components in the resonator transmission lines may be used for tuning purposes.